



Electrochemical treatment of endocrine-disrupting chemical from aqueous solution

M. Govindaraj^{a,*}, S. Pattabhi^b

^aDepartment of Chemistry, PSG College of Arts and Science, Coimbatore, Tamilnadu 641 014, India
Tel. +91 422 4303300; Fax: +91 422 2575622; email: mgrajchemist@yahoo.com

^bDepartment of Environmental Science, PSG College of Arts and Science, Coimbatore, Tamilnadu 641 014, India

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ABSTRACT

Treatment of endocrine-disrupting chemical (EDC) from aqueous solution was studied using electrocoagulation followed by electrochemical oxidation techniques. An aqueous solution of bisphenol-A (BPA) was used as the model contaminant of EDC. The present experimental study has revealed two major treatment techniques such as electrocoagulation followed by electrochemical oxidation processes. These two treatments can be operated independently in batch mode processes. In the first stage, the aqueous BPA solution was subjected to the electrocoagulation under various operating conditions. In electrocoagulation, aluminum (Al) electrode, at the current density of 12 mA cm^{-2} , 56.12% of chemical oxygen demands (COD) removal was achieved in a relatively short treatment time of 20 min. After completion of electrocoagulation, the sample was then subjected to electrochemical oxidation with different current density. In the electrochemical oxidation, complete COD removal could be achieved at current density of 12 mA cm^{-2} within 50 min of treatment time. Kinetic analysis indicates that the removal rate might be obeyed as a first order model. The results of UV-vis spectrum showed that at the end of the treatment, BPA compound was completely removed from the aqueous solution. Electrochemically produced sludge was characterized using fourier transform infra red spectroscopy.

Keywords: Endocrine-disrupting chemical; Bisphenol-A (BPA); Electrocoagulation; Electrochemical oxidation; COD removal

*Corresponding author.